

CLAIMS

1. A voltage block device, used in an electrostatic coating system in which a negative electric potential is applied to a coating material supplied from a coating material source to an spray for spraying the coating material to a coating objective to which a positive electric potential is applied, for preventing the negative electric potential from transferred to the coating material source, comprising:
 - a switching device including a slider which is selectively slidable between first and second positions and has an inlet port fluidly communicated with the coating material source and an outlet port fluidly communicated with the spray;
 - a reservoir including first and second chambers;
 - the inlet and outlet ports being fluidly communicated with the first and second chambers, respectively when the slider is at the first position; and
 - the inlet and outlet ports being fluidly communicated with the second and first chambers, respectively when the slider is at the second position.
2. A voltage block device according to claim 1, the reservoir comprising a cylinder and a double headed piston slidable within the cylinder so that the inner wall of the cylinder and the ends of the double headed piston defines the first and second chambers in the cylinder.
3. A voltage block device according to claim 1, wherein the slider comprises a body defining a bottom surface facing to the base member, an top surface opposite to the bottom surface, opposing first and second surfaces which extend between the bottom and top surfaces transversely relative to the direction of the motion of the slider;

the body further defining inlet and outlet passages extending in the body to provide the inlet and outlet ports;

the voltage block device further comprising first and second moving quick couplers which are attached to the opposing first and second surfaces respectively and fluidly connected to the inlet passage;

third and fourth moving quick couplers which are attached to the opposing first and second surfaces respectively and fluidly connected to the outlet passage;

first and second stationary quick couplers which are fluidly connected to the first and second chambers of the reservoir respectively;

third and fourth stationary quick couplers which are fluidly connected to the second and first chambers of the reservoir respectively;

the first and third moving quick couplers being coupled to the first and third stationary quick couplers and the second and fourth moving quick couplers being decoupled from the second and fourth stationary quick couplers when the body is at the first position; and

the first and third moving quick couplers being decoupled from the first and third stationary quick couplers and the second and fourth moving quick couplers being coupled to the second and fourth stationary quick couplers when the body is at the second position.

4. A voltage block device according to claim 3, the voltage block device further comprising a first moving shielding member attached to the opposing first and second surfaces around each of the first to fourth moving quick couplers.
5. A voltage block device according to claim 4, the voltage block device further comprising a first stationary shielding member surrounding the first to fourth stationary quick couplers.
6. A voltage block device according to claim 5, the voltage

block device further comprising second moving shielding members attached to the opposing first and second surfaces between the first and third moving quick couplers and second and fourth moving quick couplers respectively.

7. An electrostatic coating system, comprising:

a coating material source;

an spray, applied with a negative electric potential, for spraying the coating material from the coating material source to a coating objective, applied with a positive electric potential; and

a voltage block device, for preventing the negative electric potential from transferred to the coating material source:

the voltage block device, comprising:

a switching device including a slider which is selectively slidable between first and second positions and has an inlet port fluidly communicated with the coating material source and an outlet port fluidly communicated with the spray;

a reservoir including first and second chambers;

the inlet and outlet ports being fluidly communicated with the first and second chambers, respectively when the slider is at the first position; and

the inlet and outlet ports being fluidly communicated with the second and first chambers, respectively when the slider is at the second position.

8. An electrostatic coating system according to claim 7, the reservoir comprising a cylinder and a double headed piston slidable within the cylinder so that the inner wall of the cylinder and the ends of the double headed piston defines the first and second chambers in the cylinder.

9. An electrostatic coating system according to claim 7,

wherein the slider comprises a body defining a bottom surface facing to the base member, an top surface opposite to the bottom surface, opposing first and second surfaces which extend between the bottom and top surfaces transversely relative to the direction of the motion of the slider;

the body further defining inlet and outlet passages extending in the body and providing the inlet and outlet passage;

the voltage block device further comprising first and second moving quick couplers which are attached to the opposing first and second surfaces respectively and fluidly connected to the inlet passage;

third and fourth moving quick couplers which are attached to the opposing first and second surfaces respectively and fluidly connected to the outlet passage;

first and second stationary quick couplers which are fluidly connected to the first and second chambers of the reservoir respectively;

third and fourth stationary quick couplers which are fluidly connected to the second and first chambers of the reservoir respectively;

the first and third moving quick couplers being coupled to the first and third stationary quick couplers and the second and fourth moving quick couplers being decoupled from the second and fourth stationary quick couplers when the body is at the first position; and

the first and third moving quick couplers being decoupled from the first and third stationary quick couplers and the second and fourth moving quick couplers being coupled to the second and fourth stationary quick couplers when the body is at the second position.

10. An electrostatic coating system according to claim 9, the voltage block device further comprising a first moving shielding member attached to the opposing first and second surfaces around each of the first to fourth moving quick couplers.

11. An electrostatic coating system according to claim 10, the voltage block device further comprising a first stationary shielding member surrounding the first to fourth stationary quick couplers.
12. An electrostatic coating system according to claim 11, the voltage block device further comprising second moving shielding members attached to the opposing first and second surfaces between the first and third moving quick couplers and second and fourth moving quick couplers respectively.